

Kramer Electronics, Ltd.



USER MANUAL

Models:

TP-9, *Audio / Video Line Transmitter*

TP-10, *Audio / Video Line Receiver*

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in eight groups¹ that are clearly defined by function.

Congratulations on purchasing your Kramer TOOLS **TP-9** *Audio / Video Line Transmitter* and Kramer TOOLS **TP-10** *Audio / Video Line Receiver*, which are particularly ideal for high quality home cinema installations.

The **TP-9** and **TP-10** are also suitable for utilizing existing UTP cabling that results in an efficient, fast and uncluttered environment for:

- Studios, airports, offices and hospitals
- Security and military applications

The package includes the following items:

- **TP-9** and/or **TP-10**
- Two sets of IR emitter cables²
- Power supply³, and this user manual⁴

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables⁵

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 3.5mm to IR Emitter Control Cable (C-A35/IRE-10)

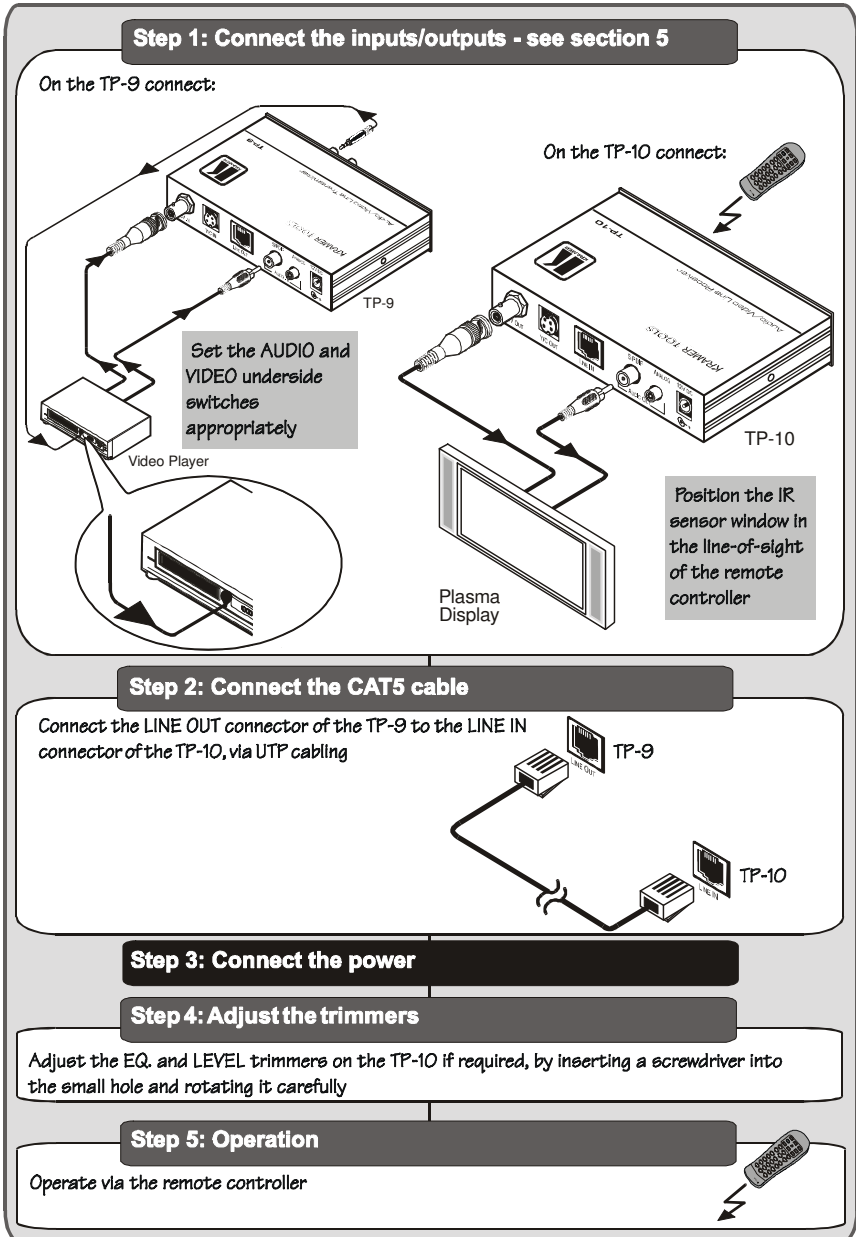
3 A separate power supply is included with each product. As an option, you can purchase the Kramer VA-50P 6 Port Universal 12-Volt Power Supply, enabling you to supply power to up to 6 Kramer devices that require 12VDC

4 Download up-to-date Kramer user manuals from the Internet at this URL: <http://www.kramerelectronics.com>

5 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

2.1 Quick Start

This quick start chart summarizes the basic setup and operation:



3 Overview

Using the **TP-9 Audio / Video Line Transmitter** with the **TP-10 Audio / Video Line Receiver** constitutes an *Audio / Video Line* transmitter / receiver system.

The **TP-9** accepts the audio and video input signals, encodes and sends them to the CAT 5 cable. The **TP-10** receives the CAT 5 signal, which includes both audio and video, decodes and distributes it to the audio and video acceptors. The IR signal from the remote control is transmitted from the **TP-10**, via the CAT 5 cable to the **TP-9**, which is connected to a video source, letting you control the video source via its remote control transmitter from a distance.

The **TP-9 Audio / Video Line Transmitter** includes:

- A composite video input on a BNC connector and an s-Video (Y/C) input on a 4p connector
- A digital audio input (S/PDIF) and an analog stereo audio input
- IR emitter outputs for up to two machines
- A CAT 5 LINE OUT RJ-45 connector for signal transmission to the **TP-10** and IR reception

The **TP-10 Audio / Video Line Receiver** includes:

- A composite video output on a BNC connector and an s-Video (Y/C) output on a 4p connector
- A digital audio output (S/PDIF) and an analog stereo audio output
- An IR sensor
- A CAT 5 LINE IN RJ-45 connector for signal reception from the **TP-9** and IR transmission
- Level and EQ. controls for the CV and Y/C signals

Kramer twisted pair adapters are an excellent way to solve remote controlling requirements without using more costly coaxial cable or fiber, or wireless transmission systems.

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **TP-9** and/or **TP-10** away from moisture, excessive sunlight and dust

3.1 About the Power Connect Feature

The Power Connect feature lets you power a transmitter / receiver system by connecting just one power adapter—to either the transmitter or the receiver.

The other unit is fed via the cable connecting between the transmitter/receiver. The Power Connect feature applies as long as the cable can carry power. The distance does not exceed 50 meters on standard CAT 5 cable, for longer distances, heavy gauge cable should be used¹.

For a CAT 5 cable exceeding a distance of 50 meters, separate power supplies should be connected to the transmitter and to the receiver simultaneously.

3.2 Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)

The decision whether to use shielded twisted pair (STP) cable or unshielded twisted pair (UTP) cable depends on the nature of the application.

It is recommended that in applications with high interference, shielded twisted pair (STP) cable is used. However, the shield itself does create a capacitance that degrades the frequency response of the machines. For shorter distances, of 50m or so, shielded twisted pair (STP) cable is preferred because it provides protection from interference (degradation is not apparent).

For long range applications, unshielded twisted pair (UTP) cable is preferred. However, the unshielded twisted pair (UTP) cable should be installed far away from electric cables, motors and so on, which are prone to create electrical interference.



Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit².

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

4 Your Audio / Video Line Transmitter and Line Receiver

This section describes the:

- **TP-9** *Audio / Video Line Transmitter*, see section 4.1
- **TP-10** *Audio / Video Line Receiver*, see section 4.2

¹ CAT 5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances

² For example: model number AD2512C, part number 2535-000251

4.1 Your TP-9 Audio / Video Line Transmitter

Figure 1, Figure 2 and Table 1 define the **TP-9** unit:

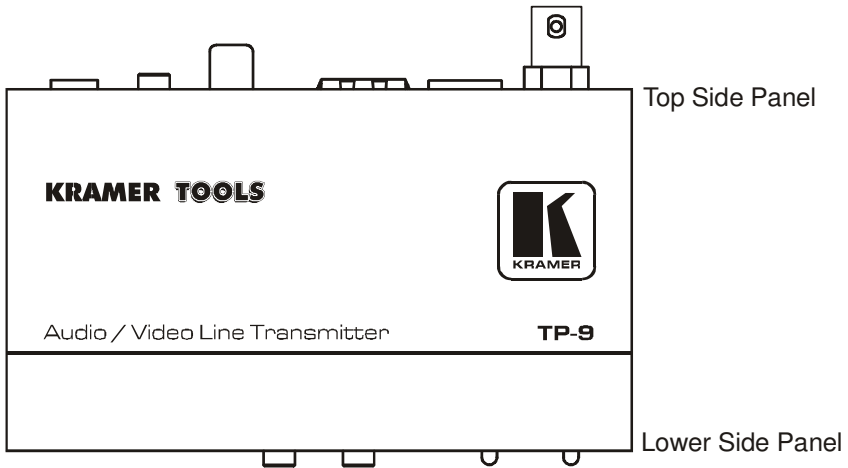


Figure 1: TP-9 Audio / Video Line Transmitter

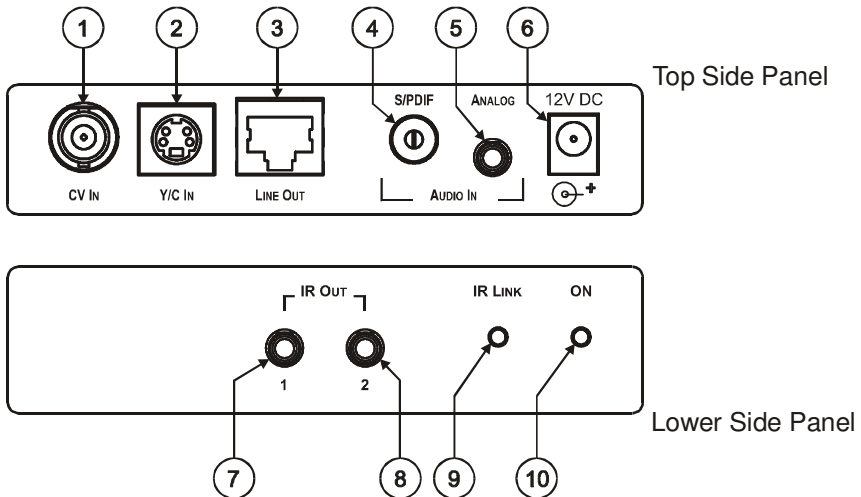


Figure 2: TP-9 Audio / Video Line Transmitter – Top and Lower Side Panels

Table 1: Features and Functions of the TP-9

#	Feature		Function
1	CV IN BNC Connector		Connects to the composite video source
2	Y/C IN 4p Connector		Connects to the s-Video source
3	LINE OUT RJ-45 Connector		Connects to the LINE IN connector on the TP-10 ¹
4	AUDIO IN	S/PDIF RCA Connector	Connects to the digital audio source
5		ANALOG 3.5mm Mini connector	Connects to the analog audio source
6	12V DC		+12V DC connector for powering the unit
7	IR OUT	3.5mm Mini connector 1	Connects to the IR emitter cable
8		3.5mm Mini connector 2	
9	IR LINK LED		Lights when an IR link is established
10	ON LED		Lights when receiving power

Figure 3 and Table 2 define the switches on the underside of the **TP-9**:

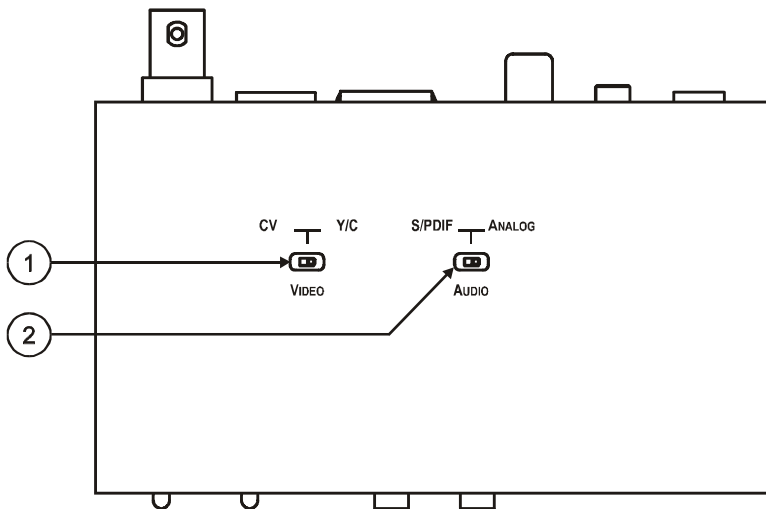


Figure 3: TP-9 Audio / Video Line Transmitter Underside

Table 2: TP-9 Audio / Video Line Transmitter Underside Features

#	Feature		Function
1	VIDEO Input Selector Switch	CV	Set to CV to transmit composite video
		Y/C	Set to Y/C to transmit s-Video
2	AUDIO Input Selector Switch	S/PDIF	Set to S/PDIF to transmit digital audio
		ANALOG	Set to ANALOG to transmit analog audio

¹ Using a straight pin to pin UTP cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 4 and Figure 8)

4.2 Your TP-10 Audio / Video Line Receiver

Figure 4, Figure 5 and Table 3 define the **TP-10** unit:

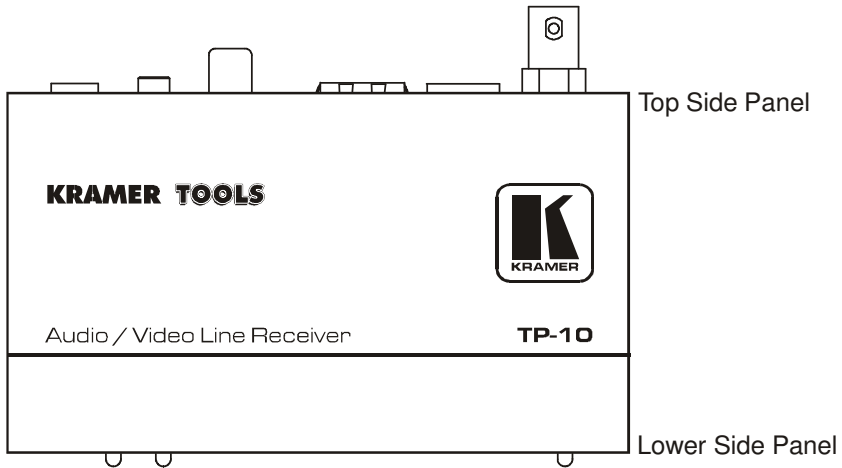


Figure 4: TP-10 Audio / Video Line Receiver

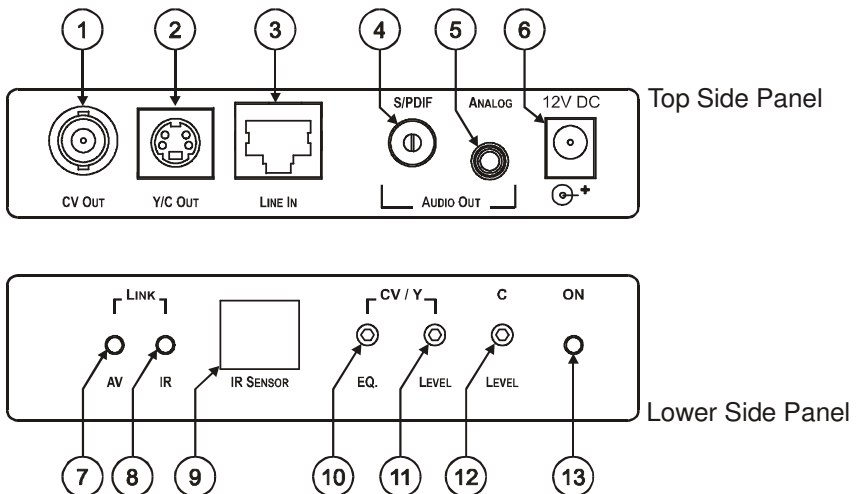


Figure 5: TP-10 Audio / Video Line Receiver – Top and Lower Side Panels

Table 3: Features and Functions of the TP-10

#	Feature		Function
1	CV OUT BNC Connector		Connects to the composite video acceptor
2	Y/C OUT 4p Connector		Connects to the s-Video acceptor
3	LINE IN RJ-45 Connector		Connects to the <i>LINE OUT</i> connector on the TP-9 ¹
4	AUDIO OUT	S/PDIF RCA Connector	Connects to the digital audio acceptor
5		ANALOG 3.5mm Mini connector	Connects to the analog audio acceptor
6	12V DC		+12V DC connector for powering the unit
7	LINK	AV LED	Illuminates when receiving the correct input signal
8		IR LED	Illuminates when receiving signals from an IR remote control transmitter
9	IR SENSOR		IR sensor red glass window
10	CV / Y	EQ. Trimmer ²	Adjusts ³ the video EQ. (equalization) compensation
11		LEVEL Trimmer ²	Adjusts ³ composite video output signal or Y output signal
12	C LEVEL Trimmer ²		Adjusts ³ the C output signal
13	ON LED		Lights when receiving power

¹ Using a straight pin to pin UTP cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 4 and Figure 8)

² If necessary (for example, when using a long cable), the adjustment range may be improved by opening the TP-10 cover and shorting the following jumpers: J9, for equalization, J7, for CV or Y levels, and J8, for C level

³ Insert a screwdriver into the small hole and carefully rotate it, trimming the level

5 Connecting an Audio / Video Distribution System

To configure a **TP-9 / TP-10** audio/video distribution system (for example, for high quality home cinema system), as Figure 7 illustrates, do the following:

1. On the **TP-9** connect:
 - A composite video source (for example, a video player) to the CV IN BNC connector
 - A digital audio source (for example, the video player's audio signal) to the AUDIO IN S/PDIF RCA connector
 - The IR OUT 2, 3.5mm mini connector to the IR receiver¹ (on the video player) via the IR emitter cable (see Figure 6)
2. On the **TP-10**, connect the:
 - CV OUT BNC connector to a composite video acceptor (for example, a plasma display)
 - AUDIO OUT S/PDIF (digital audio) RCA connector² to an audio acceptor (for example, the plasma display's audio connector)
3. Connect the LINE OUT connector of the **TP-9** to the LINE IN connector of the **TP-10**, via UTP cabling (maximum range of up to 300ft (100m)).
4. On the **TP-9** underside, set the VIDEO switch to CV and the AUDIO switch to S/PDIF.
5. On each **TP-9 / TP-10** unit, connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity (see section 3.1).
6. On the **TP-10**, if required, adjust the CV EQ. and level, by inserting a screwdriver into the small hole and carefully rotating it.

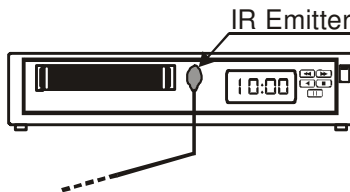


Figure 6: Connecting the IR Emitter

¹ Stick the IR emitter to the IR receiver window (usually located on the front panel of the video player)

² You can also connect either the AUDIO OUT ANALOG 3.5mm mini connector to an analog audio acceptor, or both AUDIO OUT connectors

Be sure to place the TP-10 in such a way that the IR SENSOR window will be in the line-of-sight of your IR remote controller.

You can now operate the video player via its IR remote controller from a distance.

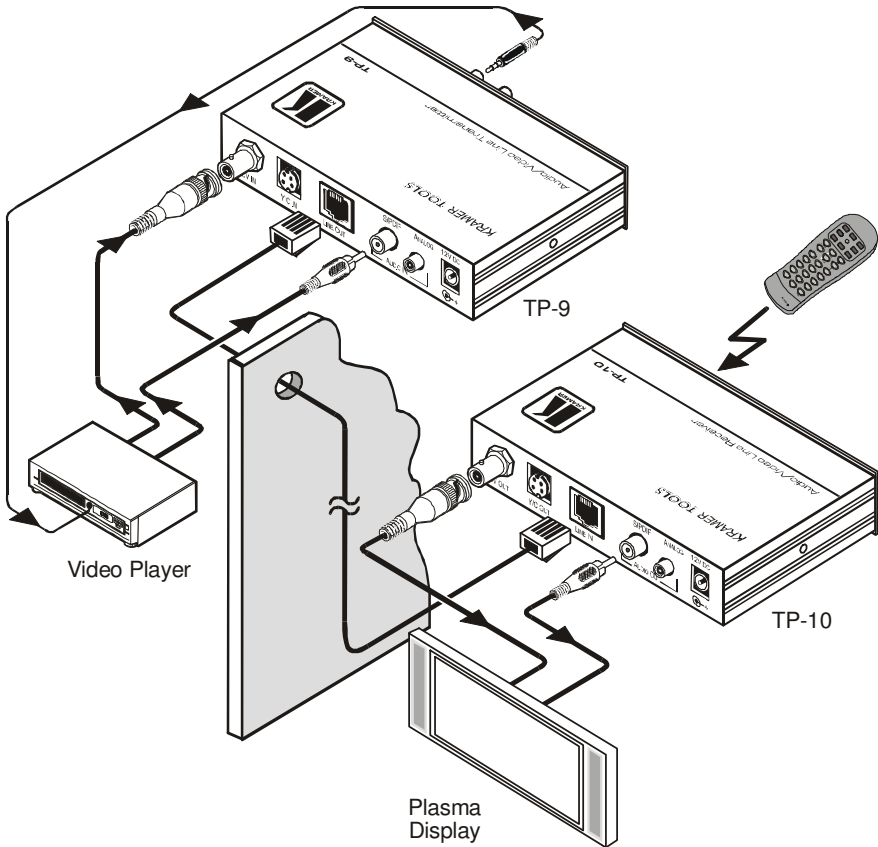


Figure 7: Audio / Video Distribution System up to 300ft (100m) UTP Cable

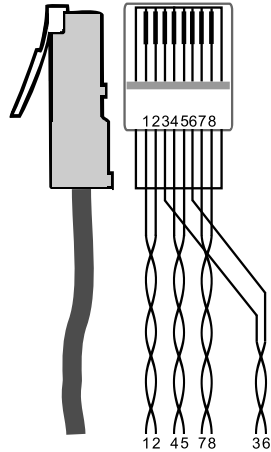
5.1 Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors

Table 4 and Figure 8 define the CAT 5 PINOUT, using a straight pin-to-pin cable with RJ-45 connectors:

Table 4: CAT 5 PINOUT

EIA / TIA 568A		EIA / TIA 568B	
PIN	Wire Color	PIN	Wire Color
1	Green / White	1	Orange / White
2	Green	2	Orange
3	Orange / White	3	Green / White
4	Blue	4	Blue
5	Blue / White	5	Blue / White
6	Orange	6	Green
7	Brown / White	7	Brown / White
8	Brown	8	Brown
Pair 1		Pair 1	4 and 5
Pair 2		Pair 2	1 and 2
Pair 3		Pair 3	3 and 6
Pair 4		Pair 4	7 and 8

Figure 8: CAT 5 PINOUT



6 Technical Specifications

Table 5 defines the technical specifications¹:

Table 5: Technical Specifications² of the TP-9 / TP-10

INPUTS:	TP-9:	1 composite video 1Vpp/75Ω on a BNC connector 1 s-Video 1Vpp/75Ω [Y], 0.3Vpp/75Ω [C] on a 4p connector 1 S/PDIF (digital audio) on an RCA connector 1 audio (analog audio) <0dBu on a 3.5mm mini connector
	TP-10	1 RJ-45 CAT-5 shielded connector (LINE IN)
OUTPUTS:	TP-9:	1 RJ-45 CAT-5 shielded connector (LINE OUT) 2 IR emitters on 3.5mm mini connectors
	TP-10:	1 composite video 1Vpp/75Ω on a BNC connector 1 s-Video 1Vpp/75Ω [Y], 0.3Vpp/75Ω [C] on a 4p connector 1 S/PDIF (digital audio) on an RCA connector 1 audio (analog audio) <8dBu on a 3.5mm mini connector
VIDEO Specifications		
MAX. OUTPUT LEVEL:	2.6V	
BANDWIDTH:	≥70MHz/-3dB	
NON-LINEARITY:	<0.05%	
DIFF. GAIN:	<0.05%	
DIFF. PHASE:	0.09Deg	
S/N RATIO:	>75dB RMS/5MHz weighted	
AUDIO Specifications		
MAX. OUTPUT LEVEL:	0dBu	
BANDWIDTH:	20Hz to 20kHz/0.1dB	
CONVERSION SAMPLE RATE:	48kHz	
CONVERSION RESOLUTION:	24 bits	
S/N RATIO:	>73dB	
POWER SOURCE:	TP-9:	12VDC, 95mA
	TP-10:	12VDC, 82mA
DIMENSIONS:	12cm x 6.95cm x 2.76cm (4.7" x 2.8" x 1.08") W, D, H	
WEIGHT:	0.3 kg (0.67 lbs.) approx	
ACCESSORIES:	Power Supply, 3.5mm to IR Emitter Control Cable (C-A35/IRE-10)	
OPTIONS	15 meter cable and 20 meter IR Emitter Extension Cables	

¹ Specifications for 100m of CAT 5 UTP cable, unless otherwise specified

² Specifications are subject to change without notice

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
 - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
 - ii) Product modification, or failure to follow instructions supplied with the product
 - iii) Repair or attempted repair by anyone not authorized by Kramer
 - iv) Any shipment of the product (claims must be presented to the carrier)
 - v) Removal or installation of the product
 - vi) Any other cause, which does not relate to a product defect
 - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on your product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

- EN-50081: "Electromagnetic compatibility (EMC);
generic emission standard.
Part 1: Residential, commercial and light industry"
- EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.
Part 1: Residential, commercial and light industry environment".
- CFR-47: FCC Rules and Regulations:
Part 15: "Radio frequency devices
Subpart B Unintentional radiators"

CAUTION!

- ⊗ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ⊗ Use the supplied DC power supply to feed power to the machine.
- ⊗ Please use recommended interconnection cables to connect the machine to other components.



For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found. We welcome your questions, comments and feedback.



Caution

Safety Warning:

Disconnect the unit from the power supply before opening/servicing.



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